

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

Confirmation No.: **1185**

CREVECOEUR et al

Atty. Ref.: **4662-306**

Serial No. **10/523,367**

Group: **1796**

Filed: **November 14, 2005**

Examiner: **WOODWARD, Ana Lucrecia**

For: **POLYAMIDE COMPOSITION, PROCESS OF PREPARATION AND USE FOR
MAKING MOULDED ARTICLES**

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September 3, 2009

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPLICANTS' BRIEF ON APPEAL

Sir:

This Appeal is from the Official Action dated June 3, 2009, finally rejecting claims 1-3, 5-8 and 10-17 presently pending herein.¹ As will become evident from the following discussion, the Examiner's rejections are in error and, as such, reversal of the same is solicited.

¹ The claims pending in this application and on appeal herein appear in the Section VIII Claims Appendix accompanying this Brief.

I. Real Party In Interest

The real party in interest is the owner of the subject application, namely DSM IP Assets B.V.

II. Related Appeals and Interferences

No appeals and/or interferences related to this application are pending.

III. Status of Claims

- A. The following claims are presently pending in this application: Claims 1-3, 5-8 and 10-17.
- B. The following claims are the claims on appeal and have been rejected in the Examiner's "final" Official Action of June 3, 2009: Claims 1-3, 5-8 and 10-17.
- C. The following claims have been cancelled during prosecution to date: Claims 4 and 9.
- D. The following claims have been allowed: None
- E. The following claims have been withdrawn: None
- F. The following claims have been objected to: None

IV. Status of Amendments

No amendments subsequent to the June 3, 2009 “final” Official Action have been filed.

V. Summary of Claimed Subject Matter²

The invention as defined by independent claim 1 is directed to a polyamide composition comprising a blend which is comprised of (a) a polyamide base resin (page 2, line 14 through page 3, line 8), (b) 0.1 to 1 weight% of a black polyaniline derivative (page 6, lines 28-29), (c) 0.1 to 5 weight% of at least one branching agent having functional groups that can react with functional groups of the polyamide base resin (page 3, lines 26-34 and page 6, lines 12-27 and original presentation of now canceled claim 4), and (d) 0.1 to 1 weight% of carbon black (page 6, lines 27-28), wherein the weight% is relative to the amount of the polyamide base resin (page 6, lines 25-26).

The invention as defined by independent claim 9 is directed to a process for preparing a polyamide composition comprising melt-mixing components (7, lines 22-23) comprising a polyamide base resin (page 7, line 26), a polyaniline (page 7, line 26-27), at least one branching agent having functional groups that can react with functional groups of the polyamide base resin (page 7, lines 27-28), and carbon black (page 7, line 28).

² The numbers in parenthesis refer to page and line numbers of the originally filed specification.

VI. Grounds of Rejection to be Reviewed on Appeal

The following rejection to be reviewed on appeal was advanced in the final Official Action dated March 3, 2009:

Claims 1-3, 5-8 and 10-17 are rejected under 35 USC §103(a) as allegedly being unpatentable over WO 02066558 (hereinafter “WO ‘558) in view of US 2003/0162900 (hereinafter “Joachimi et al”).

VII. Arguments

1. Claims 1-3, 5-8 and 10-17 are patentably unobvious under 35 USC §103(a) based on WO '558 in view of Joachimi et al

A. The Claimed Invention

The present invention as defined by the pending claims herein relates to a polyamide composition and process for making the same with the following components:

- a polyamide base composition;
- a black polyaniline derivative;
- a branching agent; and
- carbon black.

The claimed polyamide compositions of the present invention having the components noted above exhibit improved rheological behavior. In this regard, the compositions of the invention show an increased melt viscosity at low shear rates and Non-Newtonian melt flow behavior. Non-Newtonian melt flow behavior can be expressed in shear-thinning ratio. In this regard, Table 2 on page 15 (see Examples I-III) of the originally filed specification shows the improved melt viscosity at low shear rates, as well as the shear-thinning ratio.³ Improving the rheological behavior is beneficial for several processes applied in the molding industry, as for example blow molding and injection molding, as well as welding.

³ The results of Table 2 on page 15 are also graphically presented in Figure 1 (see the open squares, denoted by Ex-I to Ex-III).

B. The Examiner's Position

The Examiner acknowledges that component F1 of WO '558 is only used in an amount of 1 wt.%, but seems to assert that it would be "reasonably believed" that the individual components therein, including lubricants, carbon black and nigrosine, would be present in an amount of at least 0.1 wt.% each absent evidence of unusual or unexpected results. The Examiner thus concludes that it is statutorily "obvious" 35 USC §103(a) for a person of ordinary skill in this art to employ at least 0.1 wt.% of each of the carbon black and nigrosine materials as cited in WO '558 as well as chain branching additives as disclosed by Joachimi et al.⁴

As will become evident from the following discussion, the Examiner's rejection is based on erroneous factual premises which has in turn led to erroneous conclusions.

C. The Claimed Invention is Statutorily Unobvious

Applicant submits that the invention as a whole is statutorily unobvious. In this regard, applicants note that the following evidentiary results have been observed and reported in the originally filed specification:

1. Adding a branching agent to polyamide is well-known and results in an increase of the melt viscosity at low shear rates and/or the shear thinning ratio (see Comparative Examples A-E (CEA through CEE, respectively) in Table 2 and Figure 1).

⁴ It is noted that the Examiner has maintained her rejection based on Joachimi et al in combination with WO '558 in the final Official Action of June 3, 2009 "as per reasons of record." However, the only reason of record for combining Joachimi et al with WO '558 is expressed in the non-final Official Action dated October 10, 2008 as evidencing the art-recognized knowledge that "...parts made from similar-such polyamide compositions can be welded together as per Joachimi et al." (Page 6, paragraph 8, lines 9-10.) Thus for the purpose of this Brief, it has been assumed that the Examiner's final rejection is based on the disclosure in Joachimi et al of difunctional or polyfunctional additives having a branching and/or polymer chain-extending action.

2. Adding nigrosine to a polyamide composition comprising a branching agent, leads to a much less pronounced effect of the branching agent (see Comparative Examples G, H and I (CEG, CEH and CEI, respectively) in Table 2 and Figure 1). The melt viscosity at low shear rate only increases a relatively small amount even though the amount of the branching agent is doubled (i.e., 0.9 wt.% in CEG to 1.8 wt.% in CEI).
3. Adding carbon black to a polyamide composition comprising a branching agent has hardly any influence on the melt viscosity at low shear rates. If there is any influence at all, however, carbon black seems to lower the melt viscosity at low shear rates (see Comparative Example F (CEF) in Table 2 and Figure 1).
4. Combining the features according to the present invention, namely (a) a polyamide, (b) a branching agent, (c) carbon black and (d) nigrosine, surprisingly results in the restoration of the meaningful effect of the branching agent to increase the low shear melt viscosity (see Examples I-III in Table 2 and Figure 1), as compared with a similar composition not comprising carbon black. This attribute is most certainly not expected, as addition of carbon black to a polyamide composition comprising a branching agent exhibits only minimal influence (see point 3 above) and since a polyamide composition comprising polyamide, branching agent and nigrosine (point 2 above) has been demonstrated to have substantially less of an increase in low shear melt viscosity.

A person skilled in the art, would therefore not expect that carbon black would increase the low shear melt viscosity of a polyamide composition comprising a branching agent and nigrosine, as carbon black in a polyamide composition comprising a branching agent shows hardly any effect on the low shear melt viscosity and nigrosine

alone in a polyamide composition comprising a branching agent is shown to decrease the effect of the branching agent.

This evidence provided by way of the originally filed specification thus clearly establishes the statutory non-obviousness of the presently claimed invention.

WO '558 does not relate at all to a polyamide composition in which the rheological behavior is modified, and it is silent about melt viscosity, shear thinning ratio or burst pressure. WO '558 also is completely silent regarding a combination of black polyaniline derivative, a branching agent and carbon black in a polyamide composition having these beneficial properties. A person skilled in the art, wishing to influence the rheological behavior of a polyamide composition, would therefore not consult WO '558 as it relates to a composition with other characteristics. Even if he would consult WO '558, however he would not arrive at the present invention, as WO '558 does not relate to chain branching agents in polyamides, nor relates to influencing the rheological behavior of a polyamide composition.

Joachimi relates to an impact-resistant modified polyamide molding composition with a higher melt viscosity and improved surface quality. As acknowledged by the applicants, a known method to increase the low shear viscosity and/or shear-thinning ratio of a polyamide composition is to add a branching agent that can react with the polyamide (see the specification on page 1, lines 29-34 of the pending application). However, in those compositions comprising a black polyaniline derivative, adding branching agents does **not** result in the desired modification of the rheological behavior. (See point 2 above and Comparative Examples G, H and I (CEG, CEH and CEI, respectively) in Table 2 as well as Figure 1).

It is true that a black polyaniline derivative, namely nigrosine, is listed in Joachimi in paragraph [0091]. Carbon black is listed in this paragraph as well. In the examples, however, only carbon black is employed (see paragraph [0104] of Joachimi). Joachimi

nowhere describes a polyamide composition comprising **both** a black polyaniline derivative, carbon black and a branching agent, let alone that this combination of components leads to an improvement of the rheological properties of a polyamide composition. A person skilled in the art, wishing to influence the rheological behavior of a polyamide composition comprising a black polyaniline derivative, would therefore not arrive at the claimed invention as Joachimi does not relate to this kind of composition, let alone that the addition of branching agent and carbon black results in a improved rheological behavior.

Moreover, none of the Examples of WO '558 employ a branching agent. Instead branching agents are mentioned merely as an optional additive (see page 6 line 17 of WO'558). The composition C1, which is a styrene maleimide does not have functional groups that can react with the functional groups of the polyamide, and as such is therefore not a branching agent.

A person of ordinary skill in the art would therefore not arrive at the presently claimed invention by consulting WO '558 alone or in combination with Joachimi et al. Specifically, applicants note that:

- a) there would be no reasonable expectation for success: no branching agent was used in WO'558, let alone in combination with a black polyaniline derivative and carbon black.
- b) it would not be obvious to try, as no specification of the rheological behavior was presented in WO '558, let alone that a combination of branching agent, black polyaniline derivative and carbon black would have an influence on rheological behavior. Joachimi et al describes branching agents, but not in specific combination with black polyaniline derivative and carbon black, let alone in the amounts as presently claimed. Instead, Joachimi et al mentions

carbon black and nigrosine as possible colorants. However, nowhere is an explicit amount of such “colorants” stated, nor are carbon black and nigrosine components used together in a composition.

- c) Not all elements of the claims are clearly and unambiguously disclosed in WO '558 in combination with Joachimi et al.

On this latter point, it is noted that what is required by an analysis under 35 USC §103(a) is more than merely “cherry picking” words or phrases from one prior art reference and combining it with another. As the Supreme Court observed in *KSR International Co. v. Teleflex Inc.*:⁵

“...a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. Although common sense directs one to look with care at a patent application that claims as innovation the combination of two known devices according to their established functions, it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does. This is so because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known.”
(emphasis added)

⁵ 550 U.S. 398, 82 USPQ2d 1385, 1396 (2007)

When the applied prior art of record is analyzed properly according to the standards of *Graham v. John Deer Co.*⁶ it must be concluded that the presently claimed invention is patentably *unobvious*. Hence, reversal of the Examiner's rejection of all pending claims under 35 USC §103(a) as allegedly obvious based on WO '558 in view of Joachimi et al is in order.

2. Conclusion.

For the reasons advanced, the Examiner's rejection of the pending claims herein under 35 USC §103(a) is in error and must be reversed. Such favorable action is solicited.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: /Bryan H. Davidson/
Bryan H. Davidson
Reg. No. 30,251

BHD:dlb
1100 North Glebe Road, 8th Floor
Arlington, VA 22201-4714
Telephone: (703) 816-4000
Facsimile: (703) 816-4100

⁶ 383 U.S. 1, 148 USPQ 459 (1966).

VIII. CLAIMS APPENDIX

1. (previously presented) Polyamide composition comprising a blend which is comprised of (a) a polyamide base resin, (b) 0.1 to 1 weight% of a black polyaniline derivative, (c) 0.1 to 5 weight% of at least one branching agent having functional groups that can react with functional groups of the polyamide base resin, and (d) 0.1 to 1 weight% of carbon black, wherein the weight% is relative to the amount of the polyamide base resin.
2. (previously presented) Polyamide composition according to claim 1, wherein the branching agent comprises functional groups chosen from the group consisting of carboxylic acid, carboxylic acid anhydrides, derivatives of carboxylic acid and carboxylic acid anhydrides, and epoxies.
3. (previously presented) Polyamide composition according to claim 1, wherein the branching agent is a copolymer of at least a vinyl aromatic monomer and an unsaturated dicarboxylic acid or a derivative thereof.
4. (canceled)
5. (original) Polyamide composition according to claim 1, wherein the black polyaniline derivative is nigrosine.
6. (previously presented) Polyamide composition according to claim 1, wherein the polyamide base resin has a relative viscosity of at least 2.3 and/or an amine end group concentration of more than 20 meq/g.
7. (previously presented) Polyamide composition according to claim 1, wherein the composition comprises at least one additive chosen from the group consisting of reinforcement agents, fillers, flame retardants, stabilizers, and processing aids.

8. (previously presented) Process for preparing a polyamide composition comprising melt-mixing components comprising a polyamide base resin, a polyaniline, at least one branching agent having functional groups that can react with functional groups of the polyamide base resin, and carbon black.
9. (canceled)
10. (previously presented) Molded part comprised of a composition according to claim 1.
11. (previously presented) Process for preparing an assembled product comprising bonding together at least two parts by means of a welding technique, wherein at least one of the parts substantially consists, at least at the location of a surface to be welded, of a polyamide composition according to claim 1.
12. (original) Assembled product comprising a molded part according to claim 10.
13. (previously presented) Assembled product comprising at least two parts being bonded together by means of a welding technique, at least one of the parts is a part according to claim 10.
14. (previously presented) Molded part prepared from a composition obtained by the process of claim 8.
15. (previously presented) Process for preparing an assembled product comprising bonding together at least two parts by means of a welding technique, wherein at least one of the parts substantially consists, at least at the location of a surface to be welded, of a polyamide composition obtained by the process of claim 8.
16. (previously presented) Polyamide composition according to claim 2, wherein the polyaniline derivative comprises nigrosine and wherein the polyamide has a

relative viscosity of at least 2.3 and/or an amine end group concentration of more than 20 meq/g.

17. (previously presented) Polyamide composition according to claim 16, which comprises 0.1 to 5 weight% of said branching agent, 0.1 to 1 weight% of carbon black, and 0.1 to 1 weight% of polyaniline derivative, wherein the weight% is relative to the amount of polyamide.

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IX. EVIDENCE APPENDIX

[NOT APPLICABLE]

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X. RELATED PROCEEDINGS APPENDIX

[NOT APPLICABLE]

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XI. CERTIFICATE OF SERVICE

[NOT APPLICABLE]